

Stephen Charles Unwin

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Summary:

Dr. Unwin received his BA and PhD degrees from the University of Cambridge, and was a postdoctoral fellow and then a member of the Professional Staff at Caltech. At Caltech, Dr. Unwin studied active galactic nuclei using VLBI and X-ray techniques, and for several years he was manager of the VLBI correlator, an essential component of VLBI imaging, and he also contributed to techniques for sparse-aperture imaging. He moved to JPL in 1996 to work on the Space Interferometry Mission, and was Deputy Project Scientist for the project during its long development. He has experience with observation and instrumentation at many telescopes and spacecraft, including OVRO, Parkes, Palomar, CSO, VLA, VLBA, ROSAT, FERMI, and Kepler.

Dr. Unwin's current research interest is the detection and characterization of extrasolar planets and the dust disks that trace the formation history of exoplanetary systems. He has extensive experience in science requirements management and implementation in space instruments, and in end-to-end mission concept development. He has worked extensively with community-based science teams in his role in NASA's Exoplanet Exploration Program. He has been a co-I on several astrophysics mission proposals, and has led several proposal development teams.

Affiliations:

- Fellow, Royal Astronomical Society, admitted 1979-
- Full Member, American Astronomical Society, 1980-
- Member, Division on Dynamical Astronomy of the American Astronomical Society, 1998-
- Full Member, International Scientific Radio Union, Commission J (Radio Astronomy), 1985-
- Full Member, International Astronomical Union, 1985-

Awards:

- JPL Mariner Award 2011
- JPL Explorer Award 2009
- JPL Level-B Leadership Bonus Awards, 2000 and 2007
- JPL Team Bonus Awards, 2005, 2009 (two), 2011 (two)
- NASA Notable Added Value Award, Interferometry Section JPL, 1999
- NASA Group Achievement Award, 1993 and 2011
- Clare College, University of Cambridge, England: Entrance Exhibition, 1973; Scholarship, 1974; Murgoci Prize for Physics, 1975; Exhibition, 1975

Review Panels:

- NASA proposal review panel scientist, 1992, 1994, 1998, 1999, 2011, 2012
- Brouwer Award Selection Committee Chair, Division on Dynamical Astronomy of the American Astronomical Society 2010
- Division Chair, Division on Dynamical Astronomy of the AAS 2006–2007
- NSF Management Review Committee of Arecibo Observatory, 2007

- NAIC / Arecibo Users Committee, 2000–2003. Committee Chair, 2003
- National Science Foundation proposal reviewer, 2000–2005
- AAS / Division on Dynamical Astronomy, Committee member 2000–2002
- National Radio Astronomy Observatory Users Committee, 1992–95. Committee Chair, 1995
- Proposal Referee, U.S. VLBI Network, 1990–92

Education:

1979 PhD degree in Radio Astronomy. University of Cambridge, England. Thesis: “Distribution and Kinematics of HI in M31”. Thesis supervisor: Dr. J.E. Baldwin
 1979 Master of Arts degree. Clare College, University of Cambridge, England
 1976 BA with Honors (First Class), in Physics and Theoretical Physics, Clare College, Cambridge

Positions and experience:

- 2011-2012 Proposal Manager, NASA Earth Ventures Instrument 2011 mission proposal, JPL
- 2004–2012 Deputy Program Scientist, Exoplanet Exploration Program, JPL.
- 2006–2011 Deputy Director, JPL Center for Exoplanet Science.
- 2010 Proposal Manager, NASA Explorer 2011 mission proposal, JPL
- 2010 Proposal Manager, NASA APRA 2010 sub-orbital mission proposal, JPL
- 1996–2010 Deputy Project Scientist, Space Interferometry Mission, JPL.
- 2004–2007 Deputy Project Scientist, Terrestrial Planet Finder Interferometer Project, JPL.
- 2001–2008 Section Staff, Interferometry and Large Optical Systems Section (383), JPL
- 2002–2004 Deputy Project Scientist, Terrestrial Planet Finder, JPL.
- 1996–2002 Scientist, Interferometry Center of Excellence, (additional duty), JPL.
- 1994–1996 Project Manager and Scientist, Fast Digital Acquisition System, Caltech.
- 1991–1993 Caltech High Resolution Microwave Survey (SETI) Scientist.
- 1984–1995 Manager of the VLBI Correlator, Member of the Professional Staff, Caltech.
- 1979–1984 Research Fellow and Staff Scientist in Radio Astronomy, Caltech.
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Conferences:

I have chaired numerous workshops, working group meetings, and conferences, in addition to convening, organizing, and setting the agendas for more than 25 mission (SIM) science team meetings. I served as the principal organizer for several conferences:

- “Exploring Strange New Worlds”, Flagstaff, 2011 (SOC and LOC member)
- NASA Astrophysics Mission Concepts Studies–Pre-Proposal Workshop, Pasadena, 2007
- AAS Division on Dynamical Astronomy Annual Meeting, Halifax, Canada, June 2006 (Program Chair, responsible for the scientific program; I also served as Chair of the Division)
- “Dust Disks and the Formation and Evolution of Habitable Planets”, San Diego, 2004 (LOC Chair; and edited online proceedings)
- “Working on the Fringe”, Dana Point 1999 (LOC Chair; and edited hardcopy conference publication for Proceedings of ASP)

Research publications:

In addition to the above responsibilities, I have maintained an active astronomical research program, with over 35 papers published in refereed scientific journals since 1978. The following major papers are representative. Full list available upon request.

- Unwin, S.C., and 16 co-authors, 2012, “Coronagraphic Imaging of Debris Disk From a High Altitude Balloon Platform”, SPIE, in press

- di Lorenzo, P., Silano, D., Wiita, P., Wehrle, A. & Unwin, S. 2012, “Understanding Blazar Variability through Kepler”, APS, K1.064
- Bryden, G. et al. 2011, “Zodiac II: Debris Disk Science from a Balloon”, SPIE, 8151, 50
- Davidson, J.M. & Unwin, S.C. 2009, “SIM Lite Astrometric Observatory: from Earth-like Planets to Dark Matter”, JPL Publication 400-1360 2/2009
- Lawson, P.R., Traub, W.A. & Unwin, S.C. 2009, “Exoplanet Community Report”, JPL Publication 09-3 3/2009
- Unwin, S.C., et al. (35 co-authors) 2008, “Taking the Measure of the Universe: Precision Astrometry with SIM PlanetQuest”, PASP, 120, 38
- Catanzarite, J., Shao, M., Tanner, A., Unwin, S., & Yu, J. 2006, “Astrometric Detection of Terrestrial Planets in the Habitable Zones of Nearby Stars with SIM PlanetQuest”, PASP, 118, 1322
- Unwin, S.C. 2005, “Precision Astrometry with the Space Interferometry Mission–PlanetQuest”, *Astrometry in the Age of the Next Generation of Large Telescopes*, ASP Conference Series, 338, 37.
- Meadows, V.S., Dumas, C., Unwin, S.C., & Crisp, D. 2003 “Planetary Science and the Terrestrial Planet Finder Mission”, AAS/DPS 35.1810.
- Jones, D.L., Wehrle, A.E., Unwin, S.C., Meier, D.L., & Piner, B.G., 2003, “Location of the Nonthermal Optical Emission from Jets in AGN”, *New Astronomy Reviews*, 47, 681.
- Piner, B.G., Unwin, S.C., Wehrle, A.E., Zook, A.C., Urry, C.M., & Gilmore, D.M. 2002, “Speed and Orientation of the Parsec-Scale Jet in 3C 279”, *ApJ*, 588, 716.
- Unwin, S.C. 2002, “Space Interferometry Mission Science Operations”, *Proc. SPIE*, 4852, 172.
- Unwin, S.C. and Stachnik, R. (eds.) 2000, “Working on the Fringe: Optical and IR Interferometry from ground and Space”, ASP Conference Series, vol. 194, pp. 1-485.
- Jenet, F.A., Anderson, S.B., Kaspi, V.M., Prince, T.A., & Unwin, S.C. 1998, “Radio Pulse Properties of the Millisecond Pulsar PSR J0437-4715”, *ApJ*, 498, 365.
- Unwin, S.C., Wehrle, A.E., Urry, C.M., Gilmore, D.M., Barton, E.J., Kjerulf, B.C., Zensus, J.A., & Rabaca, C.R. 1994, “Inverse-Compton X-ray Emission from the Superluminal Quasar 3C 345”, *ApJ*, 432, 103.
- Unwin, S.C. & Wehrle, A.E. 1992, “Kinematics of the pc-scale Jet in 3C 345”, *ApJ*, 398, 74.
- Unwin, S.C. 1983, “Neutral Hydrogen in the Andromeda Nebula”, *MNRAS*, 205, 773.
- Unwin, S.C., Readhead, A.C.S., Wilkinson, & P.N., Ewing, M.S. 1978, “Phase Stability in the Drifting Subpulse Pattern of PSR 0809+74”, *MNRAS* 182, 711.